

ITS Standards: Lessons Learned from Deployment

Raising ITS Standards IQ with a Public Sector Workshop

This Report is About:

- Using workshops to increase awareness of ITS standards.

Key Lessons Learned:

- Workshops should be geared to what the participants need to know about applying ITS standards to their locales.
- Speakers who are ITS standards experts with “hands-on” experience greatly enhance the value of workshops.
- Workshops should not only transmit technical information, but also allow participants to react to and apply what they learn.



THE PROBLEM

State and local agencies need a heightened awareness of the benefits of ITS standards and how to use them, but ITS standards are a new concept to many public transportation agencies. Future federal funding for ITS projects will be dependent upon incorporating ITS standards. Despite this, when ITS standards are approached for the first time, agency staff may find them intimidating and may not automatically understand them.

Standards must be incorporated into systems already in place. Future ITS projects must be designed to incorporate ITS standards from the outset. Although the Minnesota Department of Transportation (MnDOT) has been a leader in ITS deployment, MnDOT staff, as well as Minnesota city and county agency personnel, found that they were not adequately prepared to begin using ITS standards.

A SOLUTION

MnDOT prides itself on adopting ITS and other transportation innovations to keep the state's transportation system as productive as possible. To move forward with incorporating ITS standards, MnDOT held a one-day ITS Standards Workshop in November 1999.

The workshop increased awareness of the development process for and the impact of ITS standards. Real-world examples from ITS professionals with early “hands-on” experience made a lasting impression on agency staff, and facilitated workshop discussions provided the basis for developing a standards migration plan.

THE PROCESS

The idea for an ITS Standards Workshop grew out of an earlier workshop on National Transportation Communications for ITS Protocol (NTCIP) at MnDOT. The success of that workshop led to a decision to broaden the subject to encompass all ITS standards.

To develop plans for the ITS Standards Workshop, MnDOT formed a standards advisory group. The makeup of the advisory group was based on the fact that members were individuals whose jobs were critical to the standards-setting process and who were in contact with potential audiences for the workshop—public sector staff.

The standards advisory group identified the following key information needed by public sector staff: 1) Who are the players in ITS standards development and deployment and what are they doing? 2) What have been the successes and failures in using ITS standards? and 3) How can standards migration planning be initiated in Minnesota?

Be the next in a series of lessons learned.

The ITS Joint Program Office of U.S. DOT has initiated a program to document lessons learned by first-time users of ITS standards. The program helps users of ITS standards to build on the successes, and avoid the problems, that early users have experienced. The reports are to be short, written in a non-technical style, and targeted to state and local public transportation audiences. For coverage of the lessons learned in deploying standards in your area, contact Dr. Carol Zimmerman at zimmermc@battelle.org or call 202-646-7808.

Senior MnDOT staff reviewed and approved the workshop agenda developed by the standards advisory group, and a consulting firm under contract to MnDOT implemented many of the details. MnDOT's training facility in Minneapolis was selected as the venue for the workshop.

Participants recommended by the standards advisory group, first-line supervisors within MnDOT, and city and county

agency staffs were invited to attend, as well as several equipment vendors working with MnDOT. Speakers who could provide case studies and U.S. DOT representatives also were invited. Including speakers, 68 people attended the workshop. Fifty-eight percent of the participants were MnDOT staff; 12 percent were U.S. DOT staff; three percent were local government staff; and the remaining 27 percent were consultants, vendors, and speakers. All participants were given workbooks containing specific ITS standards materials for reference after the workshop. The workbooks

addressed topics that were highlighted in the remarks of the introductory speaker, including

- What are standards?
- Why do ITS standards matter to MnDOT?
- How will the need to use standards affect the way MnDOT does business?
- What standards are likely to affect MnDOT?
- How are standards being developed?
- How are standards-compliant systems deployed?
- What additional support and resources are available?
- What acronyms might be encountered when using standards?

The workshop consisted of presentations in the morning and breakout sessions in the afternoon. This structure imparted enough information to participants to use as a basis for

problem solving. Speakers were experienced and knowledgeable about ITS standards. They provided the "big picture" on the national ITS standards program, as well as "war stories" from early deployers using ITS standards in the field. Prior to the workshop, the speakers coordinated their presentations and brainstormed a list of questions to be addressed during breakout sessions.

During the breakout sessions the presentation material was discussed, and opinions from participants were obtained. The sessions allowed participants to be task-oriented (an effective learning approach) by thinking about what was needed for the standards migration plan. Speakers for the morning presentations facilitated the breakout sessions. Answers to questions addressed in the breakout sessions were presented to the entire workshop audience and formed a basis for MnDOT actions to begin work on a standards migration plan.

The cost of the workshop was approximately \$150,000, including MnDOT staff time, consultant costs, travel expenses, food, and incidental costs. No separate facility costs were incurred since a MnDOT training facility was used.

THE IMPACT

Participants felt that their expectations for the workshop were met, partly because a mix of people with different perspectives (e.g., ITS, traffic management, electrical engineering, and operations) attended. In addition, a good cross section of the Minneapolis metropolitan area and other parts of the state was represented. The group was also mixed with regard to knowledge of, or prior exposure to, ITS standards.

Equally successful was an explanation of what had been done elsewhere and how ITS standards could be implemented in Minnesota. The case studies helped with background information. A benefit mentioned by several of the participants was bringing many stakeholders together to exchange ideas. Just starting the communication process was a big step in the right direction. The workshop proved to be a "reality check" on the ITS standards available today.

The workbook distributed at the workshop provided a good overview of ITS standards, but was *not* a cookbook on how to implement them. According to one participant, "What I

ITS Standards Workshop - Course Outline

General Overview

ITS Standards Conformance/Testing

Critical Standards

Standards Compliance Testing

FHWA Standards Internet Site—Demonstration Implementation—Case Studies

NTCIP Implemented with a Traffic Management System

NTCIP with Traffic Signal Controllers

NTCIP with Variable Message Signs

Overview of ATMS and ATIS Standards

NTCIP National and Local Activities

Standards Migration Planning

Case Study

Minnesota's Next Steps in Standards Migration

Group Presentations

learned is that, once a migration plan is developed, it is not a cookbook approach. All you can do is ask several questions with a range of ramifications, try to be comprehensive in scope, and figure it out the best you can. This is scary and not the cookbook that I wanted, but a good dose of reality.”

Another participant felt that actually deploying ITS standards would be much tougher than the workshop portrayed. “It is easy to brainstorm and throw out ideas. However, at a workshop like this, no one has any grasp of what it takes to get the ITS standards deployed. This type of workshop is a planning tool for the deployment of ITS standards. What is overlooked is the extreme difficulty of getting ITS standards implemented. It is much easier to make plans than to build, deploy, or make it work right.”

A useful suggestion made by another participant was to dedicate an entire session to problems encountered in implementing ITS standards. Practitioners need to understand where ITS standards fit in and how they will enhance agency goals, such as increasing public safety. When practitioners return to the workplace, they will find that everything happens slowly. Future workshops could provide examples and guidance to help practitioners overcome barriers to using ITS standards that result from competing demands for time and resources.

Being able to visualize the time frame in which ITS standards will be put to use was another impact of the workshop. One traffic engineer became aware that a lot of ITS standards are not ready to be implemented. In using ITS for arterial roads, she feels she can wait to see how ITS standards perform before she starts specifying their use. In the meantime, she is going to stay educated and incorporate the information gained at the workshop to be clear on which ITS standards affect her area of expertise. She recognizes that the benefits derived from ITS standards will come in the long term rather than the near term.

Transmitting the benefits of the workshop to others was a concern to some participants. One participant took on the challenge of educating his staff to identify initiatives where ITS standards would be involved. A second participant planned to determine how ITS standards apply to his local

jurisdiction and figure out the most cost-effective ways for his county to deploy ITS standards. He feels the time frame for a rural area may be different than for a metropolitan area, but wants to be ready when the time is right.

Another participant thought that a less technical session should be conducted for decision-makers at the city and county levels. Many people don’t understand that funding approval to implement ITS comes from the city councils and county boards. They, along with administrators, city mayors, city engineers, city police departments, and county sheriff’s departments, need to understand the role of ITS standards in funding requests.

In the final analysis, many real-world issues are beyond the scope of a one-day workshop. Nevertheless, having the concepts presented in discussions, workbooks, and plans and incorporated into policy guidelines are necessary first steps. Back on the job, the problems of actual practitioners create another layer of complexity. Other priorities may get practitioners’ attention first because they must juggle their regular duties while trying to implement software or hardware to meet ITS standards. Thus, while the workshop could not have an immediate impact on the complex process of selecting and deploying ITS standards, it raised awareness about what practitioners will face in ITS deployments now and in the future.

Questions Addressed During Breakout Sessions:

- What legacy components and systems will be affected by ITS standards?
- What funding sources may be available to replace these components and systems?
- What upcoming system deployments will be affected by ITS standards?
- What do the various MnDOT employees need to know about standards?
- What training and education will be required for the employees affected by standards?
- How will MnDOT support employees trying to use standards?
- How will MnDOT hold contractors to commitments about standards?
- Where in MnDOT will decisions be finalized regarding standards?

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About This Document: This document is part of a series of reports on lessons learned about deployment of ITS Standards. The report was prepared by interviewing organizers and attendees of the Minnesota Standards Workshop held in November 1999.



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NEXT STEPS

The workshop participants from MnDOT understand that a lot of work is ahead to deploy ITS standards—planning is the easy part. There is a concerted effort at MnDOT to keep the momentum going. One indicator of the momentum is that the standards advisory group stayed involved to continue development of the standards migration plan. Since the workshop, MnDOT has prepared proposals for funding to pursue migration planning, which will take several phases to complete. MnDOT also provided information about ITS standards throughout the agency by linking its Web site to U.S.DOT (www.its.dot.gov/standard/standard.htm), ITS America (www.itsa.org), and ITE (www.ite.org), where much current ITS standards information is available.

LESSONS LEARNED

MnDOT's experience demonstrates that a workshop can be effective in introducing ITS standards to transportation agencies. Other agencies can replicate MnDOT's success by drawing on the lessons they learned:

- Establish a small committee to plan the ITS standards workshop. Good candidates for committee members are those who already have some knowledge of ITS standards, have a stake in standards deployment, or have ties to key audiences targeted for the workshop. MnDOT started with several participants from an earlier workshop and added members who brought additional strengths to the committee.
- Gear the agenda to audience interests in ITS standards. The agenda should provide a comprehensive introduction to ITS standards and respond to the needs of the target audience of the locale. MnDOT started with a set of questions it wanted addressed and made sure that the agenda would provide answers.
- Structure the workshop to support the learning experience. To absorb the technical material in the presentations and apply it in interactive breakout sessions, a one-day workshop proved very effective. In fact, MnDOT held two one-day workshops, with the first workshop devoted

to NTCIP standards. NTCIP proved to be a valuable first topic because it laid the groundwork for the second workshop by preparing participants to discuss the subject with a common base of knowledge and language.

- Recruit the right ITS standards speakers to add value to the workshop. MnDOT staff most familiar with ITS standards activities at the national level used their contacts to identify speakers who could effectively address the workshop topics. Standards development organizations, such as ITE and IEEE, have committees devoted to ITS standards. Early deployers of ITS standards (e.g., state and local transportation agencies, product vendors, and system integrators) are another group of potential speakers.
- Allow for breakout sessions during the workshop. Breakout sessions provide important opportunities for agency staff to share their perspectives and react to the material provided in the presentations. In MnDOT's workshop, the breakout sessions led to recommendations that were used as the basis for a migration plan proposal.
- Make sure the target audience and audience recruitment efforts are aligned. MnDOT successfully used its internal network to get appropriate MnDOT staff to attend. However, it had difficulty attracting city and county people to the workshop. A county traffic engineer attending the workshop explained that local jurisdictions need to understand the benefits of ITS and ITS standards before they will send staff to workshops. If that is a key barrier, workshop organizers will need a strategy to overcome it or a redefinition of the target audience.
- Find ways to reinforce the knowledge about ITS standards gained at the workshop. MnDOT provided a workbook to each participant. However, more reinforcement may be needed to drive the message home. As one attendee stated, "I would like to see a follow-up workshop as we progress to help carry ideas one step further." Other ideas might include regular communication with participants about progress in ITS standards development and the experience of their peers in deploying standards.

"Before people can start using ITS standards, you have to raise the awareness of everyone involved in a region's ITS deployment."